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Kondo lattice with heavy fermions: Peculiarities of spin kinetics

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Abstract

A model of spin relaxation of Kondo lattices is proposed to explain the angular dependence of the electron spin resonance (ESR) parameters in the heavy fermion compounds Y bIr 2Si 2 and Y bRh 2Si 2. A perturbational scaling approach reveals a collective spin motion of Ybions with conduction electrons in the bottleneck regime. A common energy scale due to the Kondo effect regulates the temperature dependence of different kinetic coefficients to result in a mutual cancelation of all divergent parts in a collective spin mode. The angular dependence of the ESR intensity, linewidth and resonant frequency is shown to be in good agreement with experimental data on Y bIr 2Si 2 and Y bRh 2Si 2. In particular, the unexpectedly weak dependence of the ESR intensity on the orientation of the microwave magnetic field agrees with the properties of the discussed model. © 2012 IOP Publishing Ltd.

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